Knowledge Organiser - KS4 Design Technology Maths

Geometry:

Angle Fact

Angles around a point add up to 360°

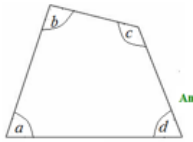
$a + b + c = 360°$

Angles on a straight line add up to 180°

$e + f = 180°$

Angles in a triangle add up to 180°

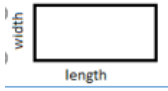
$w + x + y = 180°$



Angles in a quadrilateral add up to 360

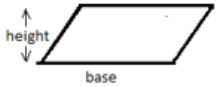
$a + b + c + d = 360°$

Area

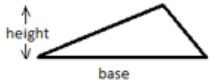


$Area = length \times width$

More Geometry:

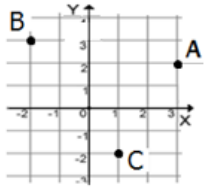


Area of parallelogram = $base \times height$



Area of a triangle = $\frac{base \times height}{2}$

Coordinates



$A(3,2)$
$B(-2,3)$
$C(1,-2)$

RATIOS - EXAMPLES

DEFINITION:

A ratio is the mathematical relationship between two or more numbers.

An example of a ratio is:

4:1

Here we see 4 blue circles compared to 1 red circle.

An example of a ratio is:

3:2

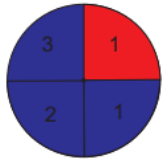
Here we see 3 blue circles compared to 2 red circles.

An example of a ratio is:

2:3

Here we see 2 blue circles compared to 3 red circles.

The circle below shows the area of blue in ratio with the area of red. There are 3 areas of red to just 1 area of blue.



BLUE : RED
3:1

RATIOS - EXAMPLES

Part of a recipe to serve two people, requires 4 cups of flour and 1 cup of water.

If the has to be scaled up to serve 10 people, how many cups of flour and water will be required as part of the recipe.

	FLOUR		WATER
SERVES TWO PEOPLE =	4	:	1

To find the number by which the original ratio numbers are multiplied, divide the new number of people to be served (10) by the old number of people to be served (2).

$\frac{10 \text{ PEOPLE}}{2 \text{ PEOPLE}} = 5$

Then, multiply each number of the original ratio by the answer 5, to find the new amount of flour and water.

4x5 : 1x5

The new number of cups of flour and water are seen opposite

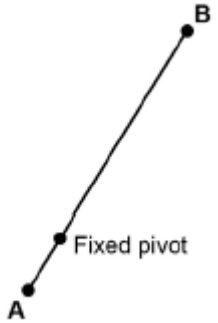
FLOUR		WATER
20	:	5

Proportion

Serves 4	Serves 8	Serves 12	Serves 2	Serves 1
184 g sugar	368 g			
304 g potatoes				
160 g beans			80 g	
24 g haddock				6 g

The diagram below shows the movement of a lever which is part of a toy.
The distance from point **A** to the pivot is 10mm.
The distance from point **B** to the pivot is 40mm.
If point **A** moves 10mm to the right, how far would point **B** move to the left?

40mm



How to find a Percentage of a number

Here are the 3 simple steps for finding a percentage of a number:

Step 1

- Convert the percentage to a decimal by dividing it by 100.

Step 2

- Multiply this decimal by the number you are finding the percentage of.

Step 3

- Check your units of measurement.

You should have now found your percentage of a number!

Example 2) Find 17% of 160m.

Step 1)

Convert the percentage to a decimal by dividing by 100.

17 ÷ 100 = 0.17

Step 2)

We need to multiply this decimal by our number.

0.17 x 160 = 27.2

Step 3)

Check units of measure.

Answer: 27.2m